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Address

IMPORTANCE OF OCULAR LESIONS AND SYMPTOMS.*

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DENVER.

In his presidential address to the American Medical Association, in 1881, John T. Hodgen, of St. Louis, put his thought regarding specialism into such clear, suggestive, forcible language that it is still quoted with approval as the summing up of professional wisdom with regard to this matter. He said: "It can not be denied that the early and exclusive study of the affections of a part, and that often a very small part of the body, has a tendency to narrow the intellectual grasp, and to cramp the powers of a man who yields to the influences incident to such partial and one-sided training."

Sixteen years before, at the first scientific meeting of the American Ophthalmological Society, Henry D. Noyes said: "The specialist has no claim to be an honorable physician who has not first gained the degree by study and fair examination. He must be well educated in general medicine and surgery, and in all their departments. . . . No part or organ can be isolated from the rest of the body in health; nor can it be isolated in the phenomena of disease."

This ideal has been nobly lived up to by the older American ophthalmologists, Agnew, Norris, Thomson, Williams of Boston, and Williams of Cincinnati. For their present high standing in the general medical profession, the ophthalmologists of America owe much to these men and to their colleagues, and especially to him who for so many years as chairman of the committee on membership of the American Ophthalmological Society, made sure that the members of that organization conformed to its high standard of ethical requirements. I mean the elder John Green of St. Louis.

In the present movement toward specialism in medicine the harm and danger of the specialist separating himself from the general profession were clearly perceived from the beginning. The figure of the vine and its branches has the same significance now as it had 1900 years ago. The separated branch, unfruitful, withered, and cast forth to destruction, has as often been seen in the history of medicine as in the history of the church. There will always be need to oppose the dangers of a narrow specialism; but that need being clearly recognized, the risk of falling into such narrowness, or resting content with it, became less.

THE DANGER OF IGNORING SPECIAL ORGANS.

There is another danger attendant on the specialization of practice; one more insidious and more general. The mass of physicians who do not undertake to treat a particular part of the body may remain ignorant of physiologic and pathologic processes as exhibited in that part of the body. Through such indifference, not only does the general profession fail to avail itself of the new discoveries and improved methods arising in a specialty, but it even forgets the older knowledge of which its predecessors availed themselves. Dr. Hodgen in the address to which I have referred, employs two instances drawn from ophthalmology, namely, sarcoma of the chorioid and sympathetic ophthalmia, to illustrate the importance of early operations; and in doing so he shows a familiarity with these conditions that many who are to-day prominent in the practice of general surgery, do not possess.

The reality of this danger is shown by the willingness of many of the profession to remain quite ignorant regarding the diseases of the organs they do not treat; and the failure of medical writers to appreciate the importance of symptoms arising in organs cared for by the specialist. It is quite common to hear the physician who regards himself as a general practitioner avow, unshamed, if not with boastfulness, his complete ignorance regarding the eye and its diseases. Such avowals show that the essential unity of the body has been largely lost sight of by the general profession. The specialist was in grave danger of thinking of the human organism as divisible, so that medically one part might receive attention while the remaining parts were ignored. He was carefully warned against this error. But, even while warning the specialist, the general profession has walked straight into this pit.

The earliest and most accurate diagnosis and the most effective treatment are no more possible to the practitioner of internal medicine, or the general surgeon who ignores the eye, then they are to the oculist who ignores the lesions and symptoms occurring in other parts of the body.

The point here urged is that the physicians and surgeons who remain ignorant of ophthalmology and ignore the eye lesions are more common than the oculists who remain ignorant of the advances in general medicine and surgery. General surgeons have learned but slowly facts with regard to antisepsis and asepsis that were early manifest in ophthalmic practice. Teachers of medicine, if they refer to pupillary symptoms at all, frequently give their students the views of an older generation. The light thrown on pathologic processes by the study of vascular disease in the eye has not been diffused very far in the realm of general pathology. Even William Osler, that master in general pathology and symptomatology, in most respects a model for broad outlook and catholic interest, in his classical paper on Chronic Cyanosis and Enlarged Spleen; A New Clinical Entity,[1] both in his analysis of the cases and in his critical remarks on the condition, makes no mention

* Address before the St. Louis Medical Society, December 7, 1907.

1. Am. Jour. Med. Sciences, August, 1903.

of the ophthalmoscopic symptoms. His own cases, both of which were under observation for considerable periods, do not seem to have been subjected to ophthalmoscopic examination, although it is likely that such examination would have thrown as much light on the general condition he had to deal with as any other single diagnostic procedure.

In general medicine, surgery and neurology, a few eminent workers, like Hughlings Jackson, Clifford Allbutt, Sir William Gowers and Jonathan Hutchinson, entered on their larger fields of practice through the gateway of ophthalmic work. These have all borne positive and emphatic testimony to the immense value they have derived from their ophthalmic experiences as a preparation for subsequent practice in other fields.

ATTENTION TO THE EYE IN THE PAST AND ITS ADAPTATION TO OBSERVATION.

Enough has been said to show that the subject is worthy of more general, careful consideration of the profession at large. In former times, when it was still recognized that the eye belonged to the body, and the general physician or surgeon felt it as important an organ to be interrogated for symptoms of disease as the stomach or the heart, it played no small part in the progress, the teaching and the practice of medicine. From Hippocrates and Celsus to Sydenham and Rush, it had its full share in symptomatology—from the deviating eyes of the convulsed infant, to the ocular signs of death.

Stillé tells us that Robert Hamilton, who first called attention to the antiphlogistic action of mercury, which assumed such overshadowing importance in the medical and surgical practice of English speaking countries a century ago, based his views on the effects of this drug in hepatitis and the ophthalmias. The melting away of iritic exudates under the influence of mercury was a favorite illustration of the power of that drug down to my own student days. At that same period the views of Cohnheim and Stricker, based on the study of inflammation of the cornea, colored all the teaching regarding inflammatory processes.

The services the eye can render to general pathology and general diagnosis have not been exhausted in the past. The situation and construction of the organ of vision are peculiarly favorable for its accurate and minute investigation. Its delicacy of structure and processes make it peculiarly sensitive to pathologic influences. The minute differentiations of the impressions received through it render the subjective phenomena of vision of peculiar importance in symptomatology, and as a basis for the study of mental processes. There is no reason to assume that the wealth of results it is capable of yielding to the careful observer has been fully developed or exhausted by the students of earlier generations.

The edema of the lids, noted by the older clinicians as a symptom of chronic nephritis does not depend, like the edema of the ankles in cardiac failure, on a peculiar mechanical relation of the parts. It is, rather, the local manifestation of a general process noticeable in the lids simply because of their delicacy of structure and their ready response to a general pathologic influence.

The same delicacy of response is manifest in the lid edema which may be brought on in susceptible individuals by the eating of fish, or other articles of diet which cause obscure autointoxication or reflexes from irritation in the alimentary canal. There remain a certain number of instances of lid edema, yet to be connected with their exciting causes, by patient study on the part of the rhinologist, the neurologist, or the specialist who devotes himself to internal medicine.

What other portion of the mucous membrane of the body can be compared with the conjunctiva for favorable situation and general fitness for the study of the physiologic and pathologic processes of the mucous membranes in general? Why have not the ophthalmo-reactions to the tubercle and typhoid bacilli been thought of until this year? Its thinness, transparency, normal adaptation to exposure, all especially prepare it for a field of intentional experiment, or one where we may best study the effects of accidental irritation and infection. As a result of this favorable situation, the reactions of the conjunctiva to living bacteria, constituting the various forms of conjunctivitis, have been more generally and more closely studied than those of any other portion of the body. There exists already with regard to this department of ocular pathology information of such extent and importance, that an acquaintance with it might well be made a point of departure for further studies regarding the bacterial diseases of other portions of the organism.

It would be hard to imagine a tissue better adapted or better placed than the cornea for the observation of the effects of injury or disease, or the processes of repair. Transparent and easily accessible, it is yet, by the closure of the lids, fairly embedded within the body. Normally free from vessels, it is rendered vascular by continued irritations. The development of vessels and the retrogressive changes of their removal, the deposit of new material and its subsequent organization into tissues, or its elimination, are all open to free inspection at the will of the observer, and without disturbing the process studied. And with the corneal microscope our studies may be carried on under lenses of considerable magnifying power.

The anterior chamber is a great lymph space, comparable for purposes of experiment to that of the peritoneum. But like the cornea, it is open to inspection and study, without disturbance of the processes continuously carried on within it. Naturally it is the lymph space of the body about which most is known. The currents of fluid within it, their chief entrances and exits; the changes in the composition of the lymph, brought about by adventitious circumstances; the progress of pathologic developments within it; its ability to dispose of the débris of disease processes; have all been studied attentively and lie open to farther investigation. It is the normal starting point for a study of lymph spaces in general.

In the iris we have open to inspection and experiment unstriated muscle, pigment epithelium, blood vessels and lymph channels; and withal a wonderfully delicate manifestation of the effects of motor nerve impulses.

In the crystalline lens there is a mass of modified epithelial tissue, the transparency of which affords the most delicate test known for the action of influences that may disturb its nutrition. With certain gross changes produced in it by sugar and naphthalin, the general profession is already somewhat familiar. More extended studies of this subject, such as have been carried on by Leber and Römer in searching for the causes of cataract, will bring to light facts of importance with reference to all tissues of epithelial origin.

OPHTHALMOSCOPIC STUDY OF DISEASE.

But it is through the ophthalmoscope that ophthalmology is able to bring its greatest contributions to gen-

eral medicine. In the words of Sir William Bowman: "The important invention of Helmholtz, by opening to the view of all instructed men the marvelous background of the transparent chambers of the eye, has gradually awakened inquiries on the part, first of the oculists, and then of physicians, which even in their infancy have yielded results of rare and unexpected value." With equal inspiration and eloquence has this been set forth by our own leader in ophthalmoscopy, Edward G. Loring: "In the whole history of medicine there is no more beautiful episode than the invention of the ophthalmoscope, and physiology has few greater triumphs. With it, it is like walking into Nature's laboratory and seeing the Infinite in action."

So vivid are the impressions that we obtain through this instrument; so fascinating are the lines of investigation that it opens up to him who has learned to use it; so intoxicating is this close contact with the phenomena and laws of life, that among the physicians who had the ophthalmoscope first placed in their hands, some, like Jaeger, devoted their lives to the path of study which it rendered possible. In the collection of sketches of ophthalmoscopic appearances which were purchased of Jaeger's heirs by the late William F. Norris, now in the College of Physicians of Philadelphia, is one on which Jaeger is said to have spent two hundred hours of labor. Think of it; twenty days, ten hours a day, in portraying a single eyeground. Such are the possibilities of ophthalmoscopy!

Of the early American students who first mastered the new instrument of precision, every one made ophthalmology his life work. You may have noticed that in the list of great general physicians and surgeons who early became acquainted with the ophthalmoscope and made their ophthalmic training a fruitful source of achievement, I mentioned the name of no American. Without exception, the able young men who went from this country in the first years of the ophthalmoscopic era to study in the German and French ophthalmic clinics, returned to devote their lives to the line of work which had so awakened their enthusiasm. Williams of Cincinnati, Noyes and Agnew of New York, Dyer and Norris of Philadelphia, Holmes of Chicago, Green of St. Louis, Pope of New Orleans, and their many colleagues, came back to create American ophthalmology, which is in some important respects the most developed branch of medical science the world has yet seen.

But whether working in a more general field or following ophthalmic practice as a specialty, the trained ophthalmoscopist has everywhere contributed to the depth, breadth and definiteness of medical knowledge. The importance of a few of his contributions to symptomatology begin to be appreciated everywhere. What he accomplished for general pathology was well indicated by Rudolph Virchow, when in portraying the change wrought in medical science by the anatomic method of investigation he said: "This change has been carried out to the greatest extent by ophthalmic surgery. . . . Since the wonderful discovery of the ophthalmoscope, anatomic analysis, even without the use of the knife, has become capable of penetrating so far into the individually remote, that we can immediately observe and study by themselves the smallest features of the fundus oculi, even, indeed, its single cells, or groups of cells, just as in an artificial preparation of an eye that has been excised."

Such enthusiasm is easily understood by any one who has watched disease process develop, through the ophthalmoscope. Recently great advance has come to medicine and surgery through exact diagnosis made possible by use of the Roentgen ray. Even ophthalmology acknowledges its important debt to the German physicist.

Yet the revelations of the Roentgen ray, compared with those of the ophthalmoscope, are as the groping among twilight shadows to clear vision in strong sunlight. Not only do we see things with the ophthalmoscope, but we see them clearly, and see them with the magnification of a good working microscope, and we see them alive. Compare the herbarium specimen with the living plant; the stuffed skin in the museum with the flying, nesting, singing bird; the best injected preparation, with the blood currents streaming through the capillaries of the frog's foot; and you may have some appreciation of the difference between the study of pathologic anatomy with the aid of the microtome, and the anilin dyes, and its study in the living eye. The great author of cellular pathology was swept away by enthusiasm for the invention of Helmholtz, because he knew that men watching the pathologic processes actually go forward in the living body, would gain an understanding and appreciation of them that could never be gained in the dead-house.

It would, indeed, be interesting to support the main proposition of this paper by passing in review a few of the contributions of ophthalmoscopy to general pathology and diagnosis. But when I recall the elaborate articles of Foerster and Norris, the three hundred to six hundred page volumes of Allbutt, Gowers, Knies and Schmitt-Rimpler, I recognize that I must respect the limitations imposed by human endurance and patience.

It would be fascinating to review the ophthalmoscopic studies of cerebral disease—cerebroscopy, Bouchut called it, with poetic license so moderate that it was admissible even in a scientific work. It would be interesting to trace the development of our knowledge of the fundus changes in renal disease, until the physician with the ophthalmoscope in his hand, becomes, through his knowledge of the sequences of disease, a prophet. The recognized ophthalmoscopic changes occurring in connection with acute specific fevers are gradually accumulating; and will in future constitute an important chapter in the descriptions of several of these diseases. The ophthalmoscope, as in the case reported by Dr. Clarence Loeb, of this city, has made the diagnosis between typhoid fever and acute miliary tuberculosis. What ophthalmologist has not been called on for positive evidence regarding syphilis? And is there any group of lesions more completely pathognomonic than those of syphilitic chorioretinitis with dust-like opacities of the vitreous?

But leaving unmentioned a list of other general and local diseases with regard to which the ophthalmoscope gives important information, let us, to bring out the growth of our knowledge of pathology through ophthalmoscopic observation, take some diseases of the circulatory apparatus. I will exclude diseases of the heart, like aortic regurgitation, causing a retinal arterial pulse; or persistent foramen ovale, with its dilated retinal veins; and the diseases which chiefly affect the constitution of the blood itself, as chlorosis, leucocythemia, polycythemia, and pernicious anemia with all their striking retinal changes. Let us consider simply the vessel walls, and the conditions affecting the circulation of the blood immediately within the retina.

VASCULAR DISEASE IN THE RETINA.

In 1854, Jaeger reported his first observation of the visible movement of blood in the veins of the retina, the intermittent blood column subsequently seen and described by others. About 1856, Virchow predicted that with the ophthalmoscope we would be able to study during life the changes connected with embolism in the retinal arteries; and in December, 1858, von Graefe observed these changes in an eye suffering from sudden blindness, the patient having an endocarditis. In 1866 other cases were published by Saemisch and Hirschman. Knapp, in 1869, reported a case in which the obstruction affected only a visible branch of the central artery and caused blindness of but part of the visual field. After this, cases of so-called embolism of the retinal artery multiplied rapidly. Many, like Knapp's, were only partial. Benson, in 1883, reported the first case, since followed by many others, where the macula escaped damage by being supplied through a cilioretinal vessel. Some cases, like Graefe's, fit perfectly with the diagnosis of embolism. But of the hundreds of cases of so-called retinal embolism now on record, a comparatively small proportion have any clear claim to that diagnosis. This fact has been pointed out, from time to time, by various observers, especially by Haab.

In 1894, Benson reported a case of transient blindness where, during the brief attack, he had the opportunity to observe a retinal artery temporarily empty; but soon becoming refilled and normal in appearance. Since then cases of the sort have been reported by several observers. The most complete is that of Harbridge, which was examined during the attacks by de Schweinitz, Zentmayer and others. It has thus been established that spasm of an artery may occur, causing complete loss of function for the time being. We have in such spasm an explanation for the visual and other sensory disturbances that attend migraine; an explanation probably applicable to other important pathologic conditions. We have thus demonstrated, also, a very important factor in the causation of more permanent vascular obstructions. Patients suffering from permanent obstruction not rarely give a history of previous attacks of transient blindness. A striking case of the kind has fallen under my own observation.

There have also gradually accumulated a very large number of ophthalmoscopic observations of permanent organic changes in the walls of the retinal vessels, with a smaller number of observations with reference to the vessels of the chorioid. These have been made most frequently in cases of renal retinitis, syphilitic diseases of the retina and chorioid, ocular lesions of gout, so-called senile changes, and some of the anemias. But such vascular lesions have also been noted in connection with acute infections and other conditions.

With the clinical histories of various forms of obstruction of the retinal circulation there have been accumulated observations of the conditions found in these cases postmortem, or on excision of such eyes for absolute glaucoma. As a result of these ophthalmic studies of vascular obstruction, the more crude notions regarding embolism, thrombosis, and endovasculitis imported into ophthalmology from the other realms of general pathology have been corrected, developed, rendered more definite, and brought into relation with one another.

Although these observations have not yet been thoroughly digested, the work of Harms and of Coats in the last few years has thrown a good deal of light on the connection of changes in the vessel walls, with different forms of obstruction occurring in the retinal vessels. It appears that obstruction in the retinal circulation, arising primarily in the arteries, is quickly attended by thrombosis in the veins; while obstruction arising from primary lesions in the veins produces thrombotic closure of the corresponding arteries. The primary changes causing obstruction are, perhaps, in the order of their frequency, (a) alteration in the intima of the vessel; (b) lowering of the arterial pressure, either by general disease, or by local spasm, and (c) the lodgment of an embolus from some distant organ. We have learned, too, that in the retina arterial obstruction is not constantly, if, indeed, generally, attended with hemorrhagic infarction.

I have made no mention of the ischemia of the retina originally described by von Graefe, or that brought about by severe hemorrhage in distant organs, or that caused by the toxic influences of quinin and other drugs. It would have been interesting, also, to review some of the experimental studies based on observation of the retinal circulation; as that by Hughlings Jackson, regarding the probable influence on the cerebral circulation of ice applied to the spine; or that by Wadsworth and Putnam on the effects of obstruction of the return of blood through the jugulars, and the influence of amyl nitrite. Neither have I mentioned retinal hemorrhage, a subject on which a volume might be written, and which is of great importance with reference to diagnosis and prognosis in many general diseases, and which is suggestive as to the pathology of conditions produced by injury. Even unusual forms of retinal hemorrhage, as those due to compression of the child during birth, compression of the thorax by violence, or those associated with cranial fracture and cerebral traumatism, are of general pathologic interest.

I have tried to suggest the enormous importance of these vascular lesions that are so frequently encountered and so readily studied by those who use the ophthalmoscope. Is this importance generally appreciated by the profession at large? I think not. In the last edition of one of our best treatises on pathology (Stengel), I find in thirty-five pages devoted to such diseases of the circulatory apparatus a single reference to the eye; a discrimination coming down to us from Cohnheim, that the retinal arteries are end arteries, like those of the base of the brain, the spleen, kidney and lung; and their obstruction is, therefore, followed by infarction. But among pages of descriptions and illustrations of postmortem appearances nowhere is it suggested that any lesion, to the elucidation of which these thirty-five pages are devoted, much less that nearly every lesion there mentioned, can be studied with greatest profit in the living body by means of the ophthalmoscope.

THE EYE DECLARES LESIONS OF RELATED PARTS.

Finally, in addition to lesions affecting the eyeball and the parts immediately adjoining and accessory to it, we are able to study through it, and these adjoining parts, and only through these, the results of lesions lying farther back—the symptoms manifested through the vascular and nervous connections of the eye.

The ophthalmic artery coming from the carotid within the skull, and the orbital veins emptying into the cavernous sinus, disease or injury within the cranial cavity is often manifest chiefly through disturbances of circulation in the orbit.

Of the twelve pairs of cranial nerves, six, including

those most expressive of deep lesions, are wholly, or in part, distributed to the eye and its appendages. The facial nerve reaches the lids and the lachrymal gland by a circuitous route through the temporal bone and the deep cavities of the face. The other motor nerves, the abducens, pathetic and oculomotor, the latter with its distant connections through the sympathetic, are all devoted entirely to ocular movements. The fifth, the nerve of general sensation of these parts, has its trophic function best revealed in the disturbances of the cornea. Lastly, the optic nerves have a high differentiation of function, and wide connections that fit them for revealing the presence and location of deep-seated lesions, with a definiteness and diagnostic value of a higher order than is possible through any other nerve in the body.

Die Neurologie des Auges, of Wilbrand and Saenger, is a work that has already reached three volumes, including some 2,400 octavo pages, and promises to continue to develop at least throughout the lives of its authors. It is the abstract of a literature as important from the point of view of general symptomatology and general pathology as any literature of equal extent to be found on the shelves of our medical libraries. Let me illustrate the diagnostic value of these symptoms by instances drawn from the domain of disturbances of the field of vision.

Diseases involving the pituitary body, and immediately adjoining parts, have in recent years attracted much attention on the part of pathologists and clinicians. In acromegaly disturbances of the field of vision are among the most significant signs of the disease in 58 per cent. of the cases (Putnam). Certainly, in a case of my own the peculiar impairment of the field of vision furnished the basis for the earliest diagnosis of the disease. In a large proportion of these cases the symptoms bring the patient first to the ophthalmologist.

In pituitary disease not attended by the gross hypertrophies of acromegaly, disturbances of the field of vision, and later atrophy of the optic nerve, are almost the only symptoms to indicate the essential character of the case. Within a year I have seen a case probably of this character. This patient had been under medical observation for several years. She was 27; menstruation commenced at 16, had always been deficient, and had ceased two years later, and from that time she had been out of health. Impairment of vision had existed for three years. But it was not until perimetry showed that the temporal fields had been especially invaded that the true seat of the essential lesion was revealed. It may be noted that the best clinical paper and bibliography on cases of this class, although in many respects they are outside the domain of ophthalmology, is one by Yamaguchi, in the Manz-Sattler *Festschrift*.[2]

Homonymous hemianopsia, when complete, is such a striking symptom, is so often fairly understood by the patient himself, that it has not been ignored in the general discussion of cerebral disease. But smaller homonymous defects in the visual field, quite generally ignored and easily overlooked, if not carefully sought for, are equally important for purposes of general diagnosis. I have met three cases that strikingly illustrate this.

An inmate of the Actor's Home, near Philadelphia, returned from the city one evening with flushed face, slight disturbance of coordination, evidences of excitement, and inability to remember where he had been since the middle of the afternoon. The superintendent accused him of drunkenness, and admonished him accordingly. He was, in fact, a total abstainer. An indefinite impression that something was wrong with his vision, although he could read small type, brought him to me, and examination showed a hemianopsia, doubtless due to cerebral hemorrhage, from a second attack of which he died.

The father of a physician, a banker, thoroughly respected by his community, had recently plunged into wild dissipation. His son brought him to me because of some difficulty with sight, and examination revealed a perfectly distinct homonymous defect of the lower left quadrant of each visual field. This was the first evidence of organic disease of the brain. He died a few weeks later of acute cerebral softening..

A man of 53, suffering from obscure nerve disturbances, was sent to me a few weeks ago by a careful neurologist in the hope that examination of the eyes might throw some light on the case, which the attending physician and the neurologist were inclined to think might be hysterical. There was no especial complaint regarding the eyes, and other methods of ocular examination threw no light on the case. In seeking for evidence of hysteria in the field of vision, however, I came on a perfectly definite homonymous defect of the left upper quadrant in each field, and on this symptom based a diagnosis of organic disease of the central nervous system. Ten days later, while on his way to Chicago in search of further counsel and treatment, the patient died suddenly, the newspapers said, of "heart disease."

PECULIAR AND UNAPPRECIATED IMPORTANCE OF OCULAR LESIONS.

The lesions of the eye have peculiar importance with reference to general pathology and general diagnosis. For hundreds of years every complete description of disease has told of the condition of the pulse at the wrist. This was not because the radial artery was the most important artery in the body; not because it was particularly susceptible to the influence of disease; not because it presented alterations that other arteries did not present, but simply because it was accessible. The changes it had in common with other parts of the arterial system could here most readily be studied. The educated finger of the physician was most familiar with the sensations produced by the radial pulse, and on that account, by examination of it, could best appreciate the changes occurring throughout the arterial system. So will it be with the eye, when the changes in it, indicative of general disease, come to be more generally appreciated. Here pathologic processes are accessible to direct examination during life. Here they have been most thoroughly and minutely studied. With regard to these lesions we are arriving at the best estimate of their general significance.

In time the ocular symptoms of disease will again be understood and appreciated by the general medical profession. More highly appreciated than ever before, since with our present knowledge they are enormously more significant and important. It is not strange that recently they have been neglected. If there was danger that the specialist studying one little organ might neglect the diseases of all other parts of the body, it was certain that the general profession, turning the care of that little organ over to the specialist, while undertaking to look after all other parts of the body, would come to neglect it more generally, more certainly, and more

2. Klin. Monatsbl. f. Augenh., 1903.

completely than the specialist could ever neglect general medicine. Only no one seems to have felt the importance of warning the profession of this greater danger. The oculist regarded the eye as his peculiar province; was inclined to think contemptuously of any acquaintance with it possible to the general practitioner, and was selfishly willing that information regarding it should always be sought through himself. He has now for years recognized that the process of confining this knowledge to the specialist has gone too far, and he has tried, in elementary papers and addresses before general medical societies, to combat the prevailing ignorance. But the results of efforts along these lines have not been sufficient to bring the general profession to any adequate appreciation of what all physicians and surgeons might learn, and ought to learn through careful study of the eye.

With the development of modern ophthalmology, in the last half-century, have come the special journals, aggregating now between twenty and thirty thousand pages per year, into which have been poured the records of the enormous number of observations regarding newly discovered facts in this domain of medicine. There have grown up, too, the special societies, and sections of general societies, to which were relegated the discussion of these newly observed facts. The general practitioner of to-day is thus distinctly at a disadvantage, with regard to keeping posted in the new knowledge of ophthalmology, as compared with the general practitioner of fifty years ago. The fact that the practice of ophthalmology is destined to be in the hands of the specialist has robbed this branch of any interest for the general medical student, beyond a sufficient knowledge of it to pass his examination in those schools in which an examination in it is required as a step toward the medical degree.

If the general medical profession is to be brought to appreciate the importance to it of modern ophthalmology, we must begin with the medical student. Admit that the average medical student does not look forward to practicing ophthalmology, neither will he practice chemistry for a profession, nor dissection, nor pharmacology. The great mass of medical men will leave bacteriology and pathologic histology in the hands of specialists. Yet these branches claim a very large proportion of the years spent in undergraduate study. Their educational and developmental value, which are unquestioned, and which justify the attention paid to them, is less closely related to practical medicine and surgery than that of a similar training in the examination of the eye, particularly with the ophthalmoscope.

The anatomic method, sedulously developed and cultivated for one hundred and fifty years, since Morgagni systematically sought "the seat of disease," has made its contribution, has laid its foundation stone in the great temple of medical science. No man working in the dead-house, though, like Rokitansky, who will celebrate his thirty thousandth postmortem examination, will ever again make a revolutionary contribution to our knowledge of disease. In the enormous swelling of the choked disc and the great changes in the color of the disc and in retinal or chorioidal pigmentation compatible with full vision, we have evidence that anatomic appearances may prove misleading. Appreciation of the fact that the anatomic method was approaching the limit of its development may be found in the London and Rome addresses of its greatest exponent, Virchow.

We are turning again to the study of disease in the living body. This is well exemplified in the address of William H. Welch on Adaptation in Pathologic Processes, delivered in Washington ten years ago, and in that on Neurology, by Putnam, at the Congress of Arts and Science, in connection with the World's Fair in this city. In the accurate study of pathologic processes during life, the skilled examination of the eye, particularly with the ophthalmoscope, must always play an important and in the near future a leading part.

Twenty-eight years ago Gowers suggested that all medical students should be taught to use the ophthalmoscope as a part of their course on anatomy. Has not the time arrived when this suggestion should be carried out? There are other directions in which clinical anatomy, as distinguished from postmortem anatomy, needs to be cultivated. But here, surely, is one point in which the training of the medical student might bring him into closer relation with the clinical problems of disease. Only when we have a generation of medical men so prepared for their life work will the importance of ocular lesions in general pathology and general diagnosis be fully appreciated.

Original Articles

INFANT MORTALITY IN THE SUMMER MONTHS.

METHODS ADOPTED IN YONKERS FOR ITS REDUCTION AND THE RESULTS.*

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Infant mortality in Yonkers during the early nineties was increasing at a greater ratio than the growth of the city. The deaths were at the maximum in July and August, and the chief causes of death were the various forms of digestive disorders. If this unnecessary waste of infant life had been allowed to go on unchecked it would have assumed alarming proportions. Two thoughtful men, one a physician, the other a layman, considered the subject and decided to take some steps to reduce the mortality. In 1893 the Nathan Strauss Milk Dispensary was opened in New York, and it was deemed a wise move to establish a similar dispensary in Yonkers, and in consequence the Milk Dispensary of St. John's Riverside Hospital was opened in 1894 and has been in operation during the summer months every year since with the exception of the summer of 1904, when it seemed impossible to procure a supply of pure milk. The founders believed that if such a dispensary were successful it would be more effective in a small community, as Yonkers had at that time a population of about 37,000, and a larger proportion of the children living in the tenements could be reached, and all physicians urged and encouraged to help in the movement, and it would be a comparatively easy matter to study accurately the death rate.

With the establishment of the milk dispensary a vigorous campaign of education was inaugurated through the press, by personal interviews with physicians, and by means of cards of instruction for mothers. Up to this time no municipal action had been taken to insure

* Read before the First District Branch of the Medical Society of the State of New York, Oct. 28, 1907.